



LA7957

## Video Switch for TV/VCR Use

## Overview

The LA7957 is an audio video switch for televisions, VCRs and other video equipment, and for audio and video amplifiers in multimedia equipment.

The LA7957 is ideal for audio and video switching in dual-tuner, BS and PIP applications.

The LA7957 operates from a 12V supply and is available in 20-pin SDIPs.

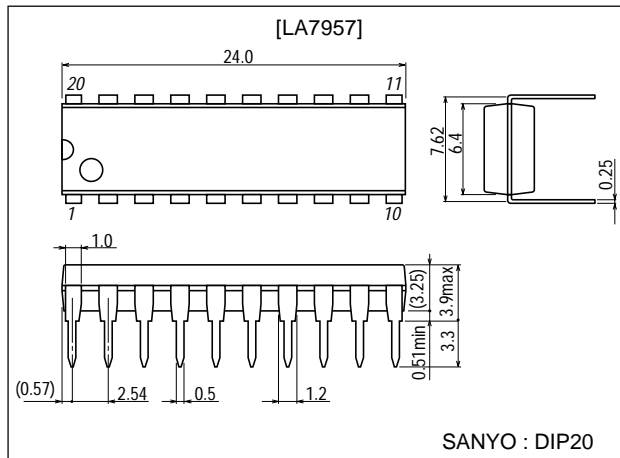
## Features

- Suitable for dual tuner, BS and PIP applications.
- Three video inputs.
- Two video outputs.
- Two stereo audio channels.
- Muting of one audio channel.
- 8.0 to 13.2V supply voltage.
- 20-pin SDIPs.

## Package Dimensions

unit:mm

3021C-DIP20



## Specifications

### Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Supply voltage	V <sub>CC</sub>		14.4	V
CONT1, CONT2 and MUTEIN voltage	V <sub>I</sub>		14.4	V
Allowable power dissipation	P <sub>d</sub> max		700	mW
Operating temperature	T <sub>opr</sub>		−20 to +70	°C
Storage temperature	T <sub>stg</sub>		−55 to +125	°C

### Recommended Operating Conditions at $T_a = 25^{\circ}\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Supply voltage	$V_{CC}$		12	V
Supply voltage range	$V_{CC}$		8.0 to 13.2	V

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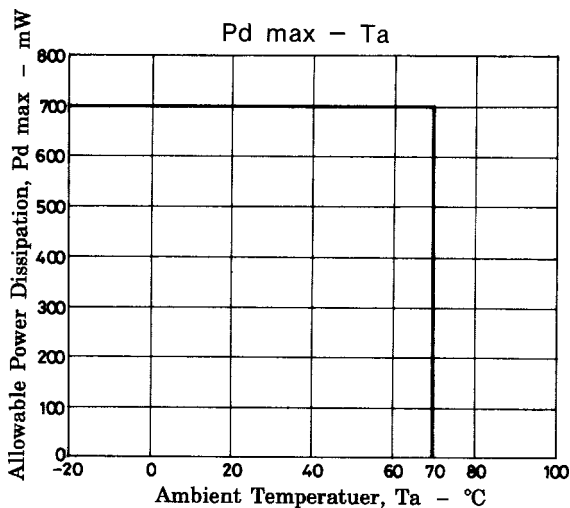
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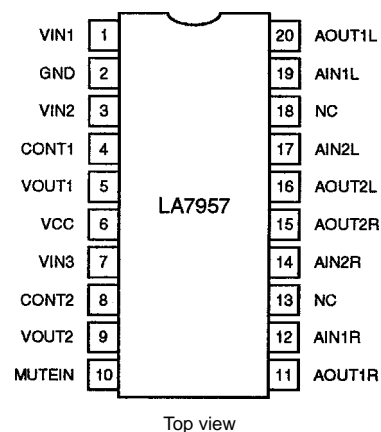
# LA7957

## Operating Characteristics at $T_a = 25^\circ\text{C}$ , $V_{CC}=12\text{V}$

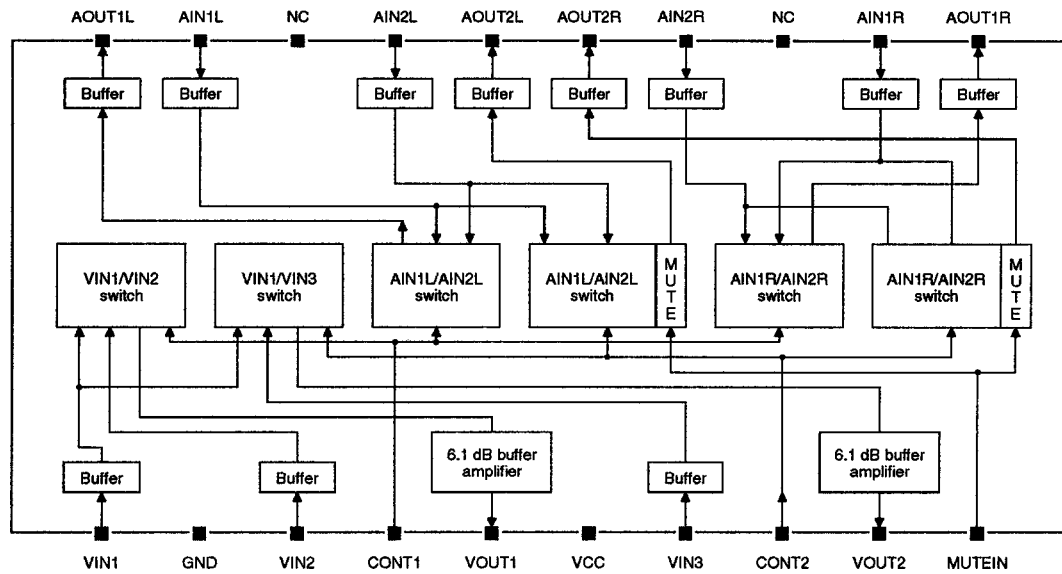
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Current drain	$I_{CC}$		35	43	57	mA
$V_{IN1}$ to $V_{IN3}$ input bias voltage	$V_{IVB}$		4.4	4.7	5.0	V
$V_{OUT1}$ and $V_{OUT2}$ output bias voltage	$V_{OV}$		8.2	6.8	7.4	V
$V_{IN1}$ to $V_{IN3}$ input impedance	$Z_{IV}$	$f=1\text{kHz}$	15	21	27	$k\Omega$
		$f=1\text{kHz}$ , $V_{IN3}$ connected to $V_{IN2}$		10.5		$k\Omega$
Video-channel voltage gain	$A_V$	$V_I=1\text{Vp-p}$ sine wave, $f=0.1\text{MHz}$	5.6	6.1	6.6	dB
Video-channel bandwidth	$BW_V$	$V_I=0.7\text{Vp-p}$ sine wave, 0.1MHz to the -3dB point	10			MHz
Video-channel noise voltage	$V_{NV}$	$R_g=75\Omega$ , 10MHz bandwidth		0.3	1.0	mVrms
$V_{IN1}$ to $V_{IN2}$ crosstalk rejection	$CT_{V1}$	$R_g=75\Omega$ , $f=3.58\text{MHz}$	45	50		dB
$V_{IN1}$ to $V_{IN3}$ or $V_{IN2}$ to $V_{IN3}$ crosstalk rejection	$CT_{V2}$	$R_g=75\Omega$ , $f=3.58\text{MHz}$	45	50		dB
Video-channel hum rejection	$HR_V$	$f=50\text{Hz}$ , $R_g=75\Omega$	18	23		dB
AIN1L, AIN1R, AIN2L and AIN2R input bias voltage	$V_{IAB}$		4.5	5.1	5.7	V
AOUT1 and AOUT2 output bias voltage	$V_{OA}$		3.2	3.8	4.4	V
AIN1L and AIN1R input impedance	$Z_{IA1}$	$f=1\text{kHz}$	47	68	88	$k\Omega$
AIN2L and AIN2R input impedance	$Z_{IA2}$	$f=1\text{kHz}$	51	74	95	$k\Omega$
Audio-channel voltage gain	$A_A$	$f=1\text{kHz}$ , $V_I=500\text{mVrms}$	-0.5	-0.02	+0.5	dB
Audio-channel bandwidth	$BW_A$	$V_I=500\text{mVrms}$ , 1kHz to the -1dB point	100			kHz
Audio-channel total harmonic distortion	THD	$V_I=500\text{mVrms}$ , $f=1\text{kHz}$		0.03	0.2	%
Audio-channel noise voltage	$V_{NA}$	$R_g=600\Omega$ , $f=20\text{Hz}$ to $20\text{kHz}$		10	50	$\mu\text{Vrms}$
AIN1 to AIN2 crosstalk rejection	$CT_{A1}$	$R_g=4.7k\Omega$ , $f\leq 1\text{kHz}$	75	90		dB
Left-to right-channel crosstalk rejection	$CT_{AS}$	$R_g=4.7k\Omega$ , $f\leq 1\text{kHz}$	72	82		dB
Mute output noise voltage	$V_{OAM}$	$V_I=500\text{mVrms}$ , $f=1\text{kHz}$		0.02	0.1	mVrms
Audio-channel hum rejection	$HR_A$	$R_g=4.7k\Omega$ Input open or mute ON	40 28	46 39		dB
CONT1 and CONT2 HIGH-level input voltage	$V_{IH1}$		1.1	1.4	1.7	V
CONT1 leakage current	$I_{L1}$	$V_{CONT1}=0\text{V}$			-3	$\mu\text{A}$
CONT2 leakage current	$I_{L2}$	$V_{CONT2}=0\text{V}$			-3	$\mu\text{A}$
MUTEIN HIGH-level input voltage	$V_{IH2}$		1.1	1.4	1.7	V
MUTEIN leakage current	$I_{L3}$	$V_{MUTEIN}=0\text{V}$			-3	$\mu\text{A}$



## Pin Assignment



## Block Diagram



## Pin Functions

Number	Name	Description
1	V <sub>IN1</sub>	Video input channel 1
2	GND	Ground
3	V <sub>IN2</sub>	Video input channel 2
4	CONT1	Video and audio channel 1 source select input
5	VOUT1	Video output channel 1
6	V <sub>CC</sub>	Supply voltage
7	V <sub>IN3</sub>	Video input channel 3
8	CONT2	Video and audio channel 2 source select input
9	VOUT2	Video output channel 2
10	MUTEIN	Mute control input
11	AOUT1R	Audio channel 1 right-channel output
12	AIN1R	Audio channel 1 right-channel input
13	NC	No connection
14	AIN2R	Audio channel 2 right-channel input
15	AOUT2R	Audio channel 2 right-channel output
16	AOUT2L	Audio channel 2 left-channel output
17	AIN2L	Audio channel 2 left-channel input
18	NC	No connection
19	AIN1L	Audio channel 1 left-channel input
20	AOUT1L	Audio channel 1 left-channel output

## Output Selection

CONT1	CONT2	MUTEIN	VOUT1	VOUT2	AOUT1L/R	AOUT2L/R
LOW	LOW	LOW	V <sub>IN1</sub>	V <sub>IN1</sub>	AIN1L/R	AIN1L/R
LOW	HIGH	LOW	V <sub>IN1</sub>	V <sub>IN3</sub>	AIN1L/R	AIN2L/R
HIGH	LOW	LOW	V <sub>IN2</sub>	V <sub>IN1</sub>	AIN2L/R	AIN1L/R
HIGH	HIGH	LOW	V <sub>IN2</sub>	V <sub>IN3</sub>	AIN2L/R	AIN2L/R
LOW	LOW	HIGH	V <sub>IN1</sub>	V <sub>IN1</sub>	AIN1L/R	—
LOW	HIGH	HIGH	V <sub>IN1</sub>	V <sub>IN3</sub>	AIN1L/R	—
HIGH	LOW	HIGH	V <sub>IN2</sub>	V <sub>IN1</sub>	AIN2L/R	—
HIGH	HIGH	HIGH	V <sub>IN2</sub>	V <sub>IN3</sub>	AIN2L/R	—

### Note

When using the two-input, two-output configuration, V<sub>IN2</sub> and V<sub>IN3</sub> should be connected externally.

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